Contributions of G.Asok Kumar to the Namami Gange Program

Sri Asok Kumar G, IAS, (Retd), 1991batch, Telangana Cadre made very significant all-round contribution for the now acknowledged, appreciated and accepted successful efforts in reducing the pollution level in River Ganga and rejuvenating River Ganga and its tributaries, with effective multilevel, multi-faceted and some quite innovative interventions using science and technology, IT, administrative and regulatory measures; tradition and faith and with effective people's participation.

In a nutshell, some of the reasons for his extraordinary success in cleaning up the River Ganga and its rejuvenation are:

During his tenure in NMCG, there was

1. a substantial increase (almost 3 times) in sewage and industrial effluent treatment capacity created by NMCG in the Ganga basin;
2. innovative, tighter and technology led monitoring which ensured that all STPs/ETPs in the Ganga basin were actually kept operational;
3. a paradigm shift in the focus and implementation of the Namami-Gange program- from a Contractor driven engineering solutions oriented one to People-centric, decentralised, transparent and outcome based one;
4. focus on Arth-Ganga as the major intervention for river rejuvenation;
5. phenomenal increase in people's participation in rejuvenation efforts;
6. building of empowered Institutions for sustainability- setting up of the District Ganga Committees (DGCs) and DGC-forum (4M) meetings, River Basin Management (RBM) Unit, Permission Cell, Jal Shakti Kendras, River Cities Alliance and Global River Cities Alliance, Urban River Management Plans, District Ganga Plans, PRAYAG etc;
7. building of Capacity of field staff, officers in states other stake holders;
8. extensive and innovative application of Science and Technology;
9. appreciatively improved financial discipline and transparency;
10. strengthening & firm application of the Regulatory Powers of NMCG;
11. lots of appreciation and recognition- invites to share the Ganga success at UN Water Conference, UNHQ, New York; World Water Week, Stockholm; International River Symposium, Vienna; Asia Pacific Water Forum, Kumomoto, Japan; IWA meeting, Denmark etc.
12. recognition of Namami Gange as "one of the top 10 "World restoration Flagship" initiatives by UN at the 15th COP meeting on biodiversity in Montreal on 13 December, 2022.

For more details on his interventions in the Namami Gange Program please visit https://asokji.in/ or
https://asokji.in/node/1058 and https://asokji.in/node/1059 and
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https://asokji.in/node/1062 and https://asokji.in/publications
AND
https://asokji.in/sites/default/files/NamamiGange_Handbook-Feb24.pdf or
http://nmcg.nic.in

As seen from the above, using innovative interventions, involving cutting edge technologies, effective decentralisation and people's active participation, Asok Kumar could achieve visible, appreciated, acknowledged and documented improvements in river water quality in River Ganga and its tributaries and their rejuvenation. He also conceived and setup many institutions like the District Ganga Committees, PRAYAG, River Basin Management Cell, Permission Cell, Ganga Knowledge Centres, River Cities Alliance, Global River Cities Alliance, Jalaj Units and Jal Shakti Kendras etc which are now well established in the ground for sustained rejuvenation and cleaning of River Ganga systems.

G. Asok Kumar has also made major contributions to the Indian water sector. As Mission Director, National Water Mission, in 2020 he started a hugely popular and effective water conservation campaign "Catch The Rain", with the tagline, Catch The Rain, where it falls, when it falls", which earned him the moniker "The Rain man of India". The campaign was appreciated by Hon PM Modi, who launched it as a nationwide "Jal Shakti Abhiyan: Catch-The-Rain Campaign" on 22 March 2021. Asok Kumar also started "Jal Shakti Kendras", a common water resource centres, in all districts of the country; "National Bureau of Water Use Efficiency"; and launched "Sahi Fasal" campaign to nudge farmers to diversify to crops which are water and climate appropriate and less water intensive to earn "more net-income per drop."

He is a recipient of many awards and recognition for his contributions in various diverse sectors, including water and river rejuvenation.

It is substantiated in details as follows:

1.0 River Ganga and its tributaries are not only India's most important river systems whose basin is home to 40% of India's population, but also is a part of India's culture and civilization. Over the years, River Ganga was getting polluted and efforts have been made to clean it since 1985. But after the launching of Namami Gange, a flagship program of Government of India, in 2014, and particularly in the last few years, Ganga is getting cleaner and stands out as a beacon of hope for other rivers in the country. National Mission for Clean Ganga (NMCG) is the implementing agency for "Namami-Gange.

2.0 G. Asok Kumar is associated with NMCG since 18 February 2019-- first as Executive Director (Projects) and then as its Director General. From the experiences gained in Ganga Rejuvenation, he initiated and signed MoUs for preparing "CAMP (Conditional Assessment and Management Plan) for other 6 major rivers basins (Krishna, Godavari, Cauveri, Mahanadi, Periyar and Narmada) involving 12 IITs/NITs under the leadership of IIT, Kanpur, in the lines of GRBMP (Ganga River Basin Management Plan prepared in 2014 by a consortium of IITs). He superannuated from Government Service on 29-Feb-2024 working as Director General, National Mission for Clean Ganga in the rank of Secretary to Government of India.

3.0 During his tenure, Namami Gange Program scaled new heights, made significant progress & won many international accolades. It was recognized by the UN as one of the top 10 "World Eco- Restoration flagships" at the COP 15 of Biodiversity at Montreal on 13 December 2022. This was done by UNEP and FAO led "UN Decade", after examining over 160 eco restoration programs across the world. These were examined on "their effectiveness & success to halt environmental degradation, reverse it, with people's active participation", etc.

3.1 In his tenure as Director General from 1 January 2022 to 29 February 2024, Projects completion in NMCG saw a massive leap. Compared to 993 Million Litres Daily (MLD) sewage treatment capacity (74 Projects- 62 in Mainstem and 12 in tributaries) created in the Ganga Basin under Namami-Gange in the 8 year period from 2014-2021, additional 2593 MLD treatment capacity was added in just 2 years-2 months period. Another 343 MLD treatment capacity was scheduled to be completed by 31 March 2024. That would be make it 2936 MLD or nearly 3000 MLD treatment capacity added in 2 years 3 months!

3.2 This has improved quality of water in the river, INDICATED by**:**
(1) The reduced number of polluted river stretches seen in reduced BoD (Biological Oxygen Demand) levels (<3 milligram/litre); increased DO (Dissolved Oxygen) level (>5mg/lt) as reported by CPCB (Central Pollution Control Board);
(2) improved bio-diversity (increased sightings/sighting-river stretches of Dolphins, Otters, gharials etc) as reported by Wildlife Institute of India and villagers on the banks of the rivers and
(3) the positive appreciation from the pilgrims who take dip in River Ganga.

4.0 Namami Gange was launched for 5 year period with a committed budget of Rs 20,000 Crores. This was further extended to 2026, with Rs 22,500 Cr budget. The program, when launched in 2015 based on the National Ganga River Basin Management Plan (NGRBMP) prepared by a consortium of 7 Indian Institutes of Technology (IIT)s, led by IIT, Kanpur, had 4 pillars- the Aviral Ganga (the unrestricted flow), Nirmal Ganga (unpolluted flow), Gyan Ganga (Knowledge management) and Jan Ganga (People participation). In 2019, on the suggestion of Hon PM at the 1st National Ganga Council (NGC) meeting in 2019, another pillar ie **Arth-Ganga** (River people connect using an economic bridge) was added. G. Asok Kumar handled the 1st meeting of the National Ganga Council on 14 December 2019 at Kanpur as ED (Projects) and the 2nd meeting of National Ganga Council on 30-December-2022 at Kolkota, as DG, NMCG.

5.0 For the significant improvements in the outcome of NGP during his tenure, some of the initiatives of G. Asok Kumar include:

5.1 In his tenure as Director General from 1 January 2022, projects completion saw a significant jump. Compared to 993 Million Litres Daily (MLD) sewage treatment capacity Asok Kumar could create additional sewage treatment capacity of 2936 MLD or about 3000 MLD in 2 years 3 months period!.

5.2 G. Asok Kumar could achieve this due to closer, tighter, periodic monitoring of the projects; frequent site visits; and pro-actively engaging with all stake holders (state governments, municipalities, departments of power, public works, forest etc in the state and Ministries of Railways, Defence, Environment and Forest and Climate Change, National Highways Authorities of India (NHAI), Cantonment boards in the Government of India) to remove the bottle-necks in like long pending-permissions; delay in taking decisions; issues related to site and land etc. This led to speedy completion of large number of projects, some started even as early as 2015! Training programs/capacity building exercises of officials at the local level were taken up and Decentralized monitoring by

empowered District Ganga Committees was encouraged for better and faster implementation. Improved transparency and better financial management brought about high credibility for the program. Introduction of 100% Single Treasury Accounting system in 2023-24 and completion of audits of accounts of previous 5 years resulted in huge savings and much cleaner balance sheet, which was very positively commented upon by the CAG's audit team.

Improved transparency and faster decisions have facilitated increased participation of bidders, which has resulted in competitive biddings now in the tenders floated by Namami Gange. From 3-4 participants in Tenders earlier, the number of bidders have significantly increased. The Meerut bid in 2022 had 19 bidders and the Indore bid in 2023 had12 bidders. In most of the tenders, there are atleast 6 bidders now! This showed the confidence of bidders and their trust in the management of Namami-Gange under the leadership of Asok Kumar.

5.3 With the operationalisation of large number of Sewage Treatment Plants (STPs) or recently reimagined and re-branded as Nirmal Jal Kendras (NJKs) and the industrial effluent treatment plants constructed with NMCG funds, the river water quality has improved very much. All along the 2525 kms main stem, the Dissolved Oxygen(DO) levels are much above the mandated, minimum prescribed level of 6 mg/litre. There are only 2 small stretches, with Biological Oxygen Demand (BOD) more than the maximum mandated level of 3 mg/litre**.**

This has resulted in increased biodiversity- with more sighting of Dolphins in more stretches, more otters and Gharials etc. As per the reports of Wildlife Institute of India (WII) the number of Dolphins have gone up from 2000-2200 in 2018 to 4000-4400 in 2023. Dolphins and their juveniles are being sighted even in tributaries.

5.4 A dash board **PRAYAG**- (**P**latform for **R**eal-time **A**nalysis of **Ya**muna, **G**anga and their tributaries)- was launched on 20 April 2023. This monitors the functioning of about STPs 24 by7. Realtime reports from **308** STPs on the banks of the rivers Ganga is captured every 15 minutes at the central server in PRAYAG. Moreover, 110 sensors to monitor river water quality sends periodic reports to the server. SMS notifications are sent to the authorities concerned, if there are failure in quality performance. This was a major step in ensuring that the STPs and CETPs constructed are functional and operated 24by7, putting an end to earlier practices of non-operation of STPs by contractors to reduce O&M costs. Live Feed cameras from 50 STP projects are being implemented.

PRAYAG has many GIS based information portals. Apart from the Real-time water quality monitoring, it has geotagged the details of the location of (a) all STPs built with all sources of funds- state, central, (b) all Grossly Polluting

Industries in the Ganga basin; (c) all drains falling into the river Ganga, most of which have been tapped & d) digital mapping of all utilities in 172 towns in Ganga basin (being added in phases). In addition to this, on 28 February, 2024 Digital "Kilometer stones" were added on the GIS map of the central line of the mainstem Ganga, accurately marking digitally latitude-longitude details of every kilometer distance from the Origin of Ganga to Ganga Sagar, where it meets the Bay of Bengal. This is the first time such an initiative was taken on any river in India. Division of the river into one kilometer segments, helps in closer monitoring of the river.

5.5 As for the Aviral Ganga or ensuring continuous flow of environmental flow of water in the river, detailed studies for the notification of the e-flow was taken up with the help of technical experts from GIZ. After 2 years of study involving many stakeholders, they have submitted a final report in November 2023.

5.6 District Ganga Plans were prepared for 4 districts, with the guidance of GIZ and WWF, and released on 21 November 2023. A River Basin Management Unit was set up in NMCG on 3 December 2023, to co-ordinate the implementation of these and the Ram-Ganga River Basin Management plans, prepared with wide ranging of consultations with stakeholders in 2022-23. Ram Ganga is a very important tributary of River Ganga and this was the first step towards decentralized river basin management, proposed to be taken up for the sustainability of the efforts of Namami-Gange involving all stakeholders.

5.7 During his tenure, Guidelines were prepared and released for: (a) safe reuse of treated water (b) Preparation of District Ganga Plans, (c) Preparation of Urban River Management Plans (d) construction of Constructed wet-lands (e) Riverine Island Policy (f) ecological flow calculations etc, which laid strong foundations for policy formulations in these issues.

5.8 A sophisticated Ganga Monitoring Aqua Lab was set up in Wildlife Institute of India, (WII), as part of a project to do the ecological assessment of Ganga basin. A Two-year MSc Course in Freshwater ecology and Conservation, fully funded by NMCG, was started from the 2024 Academic year at WII.

5.9 Many initiatives were taken to improve urban water and river management. River cities alliance launched with 20 Ganga basin cities on 25 November 2021, grew to a mammoth organization with143+ cities on the banks of various rivers in India as members by February 2022. It was expanded and launched as "Global River Cities Alliance" on 10 December 2023, at the CoP28 meeting in Dubai. On 6 December 2023, Asok Kumar, on behalf of River Cities Alliance,

signed a Memorandum of Common Purpose with the 124 member Mississippi River Towns and Cities Initiative (MRTCI) of the USA.

5.10 There was enhanced cooperation with international funding agencies like World Bank, GIZ, ADB etc. Asok Kumar headed Ministry of Jal Shakti's working groups with countries like Israel, Denmark, Netherlands Japan, EU etc. This boosted the synergetic mutual cooperation by opening Centres of Excellence to share knowledge and technology in water and river management.

6. Change in Focus of Namami-Gange during the tenure of G.Asok kumar

6.1 During G. Asok Kumar's tenure as DG, NMCG, there was a conscious effort to change Namami Gange Program from a contractor driven, STP construction program to a sustainable, peoples' movement, as envisioned by Hon'ble Prime Minister. Hon'ble PM in the 1st meeting of the National Ganga Council on 14 December, 2019 at Kanpur espoused the concept of "Arth Ganga" to make the "river-people connect" through an economic bridge.

6.2 In March 2022, under the leadership of G. Asok Kumar, the 6 verticals of Arth-Ganga were formalised to strengthen the river people connect – viz-
(i) Zero Budget Natural Farming – to promote chemical fertilizers free natural farming using traditional Indian practices, promoting "Gobar Dhan" etc to increase NET-INCOME of farmers
(ii) Reuse and Monetisation of Treated water and sludge from STPs to reduce consumption of potable water for non-potable purposes and to increase the revenue of Urban Local Bodies with the sale of treated water and sludge
(iii) Promotion of livelihood opportunities for the people on the banks of Ganga river- by starting JALAJ model for sale of products like local weaves, sarees, local food produces etc from Ganga basin and by river ranching for improved fish catches for local people;
(iv) Promotion of Cultural heritage and tourism –NMCG did extensive mapping of tangible & intangible heritages on the banks of Ganga. Promoting responsible tourism, it built capacities of local people to supply house-keeping items and services to hotels in tourist destinations like Rishikesh, Haridwar etc; to act as tourist guides, and to provide home stay facilities etc;
(v) People's participation in preparations of River Basin Management (RBM) Plans, District Ganga Plans, cleaning of Ghats, Ghat pe Yoga, Ghat pe Artis;
(vi) building up of institutions and capacities of stakeholders like formation of District Ganga Committees and holding DGC forum meetings (District Ganga Committees 4M-Monthly, Mandate, Minuted and Monitored meetings), formation of River Cities Alliance, Global River Cities Alliance; preparation of

Urban River Management Plans (URMPs), building capacities of Municipal officials and stake holders to prepare good, bankable DPRs, URMPs etc.
All these were to be achieved with active co-operation and participation of other Ministries/ Departments concerned, in the true "Whole of Government" approach advocated by the Modi Government.

6.3 Actions taken under Arth-Ganga during the tenure of G. Asok Kumar:

In March 2022, under the leadership of G. Asok Kumar, the 6 verticals of Arth-Ganga were formalised to strengthen the river people connect. These are

(i) Zero Budget Natural Farming – to promote chemical fertilizers free natural farming using traditional Indian practices, promoting "Gobar Dhan" - cow dung and cow urine based manures etc to increase NET-INCOME of farmers. This is an important intervention, as runoff water from the agricultural fields on the banks of rivers carry chemical fertilizers applied in large scale by the farmers. This non-pointed pollution source is very difficult to be stopped and treated. Moreover, these chemicals adversely affect the aquatic animals like dolphins, fishes in the river and other biodiversity in the basin and also interfere with the proper operation of STPs using aerobic processes for treatment of sewage, set up in cities and towns along the banks of the river.

Ministry of Agriculture and Farmer Welfare is promoting Bharatiya Prakritik Krishi Paddhati (BPKP) or traditional agriculture practices, which are different from organic farming. Under this, traditional farming symbiotically using the friendly microbes of the soil and enriched by cow-dung & urine based formulations are promoted. This results in low cost of cultivation to farmers, and hence increased net-income to farmers, besides being very environmentally friendly. It also helps to increase soil moisture and uses less water.

NMCG signed MoU with Shakar Bharati, a co-operative based organization, on 16 August 2022 to set up 75 Ganga Sahakar Grams; to organize massive training programs for farmers on natural farming and to set up FBOs (Farmer Based Organizations) to help market their produce. In September 2023, NMCG set up its first commercial, retail outlet for these natural products at the JALAJ Awareness and Marketing (JAM) Centre at Dilli Haat in New Delhi. In the first 7 months of its operation Rs 25 lakh worth products were sold at this outlet.

NMCG also signed a MoU with the Ministry of Agriculture and Farmer Welfare on 20th September 2022, Art of Living group on 21st October 2022, Pathanjali on 31st October 2022, to organize training programs for farmers. Under these MoUs, many training programs were organized training over 10000

farmers. Exposure visits of farmers to Subhash Parlekar's farms in Nasik and Acharya Devvrat's farms in Gurukul Kurukshetra were also taken up in 2022. 56 submissions were received for a call of Expression of Interest (EoI) floated for promotion of Natural farming in Ganga basin with the objective of Capacity Building of farmers in Natural Farming.

(ii) Reuse and Monetisation of Treated water and sludge from STPs to reduce consumption of potable water for non-potable purposes and to increase the revenue of Urban Local Bodies with the sale of treated water and sludge. A "National Policy Framework for safe Reuse of Treated Water" was prepared by NMCG in association with international experts from GIZ (Germany) under Indo-European Water Program in September 2022 and sent to Chief Secretaries of all states and other stakeholders for further action. It was formally released at the State Water Ministers' conference in Bhopal on 6 January 2023.

Since April 2023, NMCG has started supplying 8 MLD treated water to Indian Oil Corporation Limited (IOCL) for its refinery in Mathura, Uttar Pradesh. MoU was signed with Ministry of Power on 22 December 2022 for using the treated water from STPs in identified Thermal Power plants within 50 Kms radius of STPs. 23 Power Plants of NTPC were identified and DPRs for these are being prepared. MoU with Ministry of Railways was also signed and discussions taken forward with DRMs of Prayagraj, Agra and Jhansi divisions for the use of treated water in Railways. Farmers are also motivated to use treated water for irrigation. This will reduce the abstraction of good water for irrigation and will lead to increased flow of water in the rivers. Farmers of Jagjeetpur in Rishikesh are using the treated water from the 68 MLD STP for irrigation. Necessary amendments in the Authority order to permit treated water into irrigation canals was notified in January 2024.
Characteristics of Sludge from various STPs were scientifically studied by IIT, Roorkie and IIT, Kanpur and papers presented in 2023. EoI was called for use of sludge in various sectors and 52 stakeholders have responded. The sludge is being contemplated as a soil conditioner for enrichment of top soil or as a natural fertilizer after appropriate fortification.

Sale of treated water to industries and sludge will help to augment the revenue of fund starved Local Bodies (Urban and local) in the Ganga basin districts.

(iii) Promotion of livelihood opportunities for the people on the banks of Ganga river- by starting JALAJ model for sale of goods and products from Ganga basin like local weaves, sarees, local food produces etc and improved fish catches etc for increased income generation for local people. On 16 August, 2022, in association with Wildlife Institute (WII) of India, 29 JALAJs out of the

planned 75 JALAJs were launched. By December 2023 more than 45 JALAJs were functioning.
A JALAJ Awareness and Marketing (JAM) Centre was started on 17/9/2023 at Dilli Haat to promote awareness about Namami Gange activities & sale of products produced by people from Ganga basin and for selling the products made by women Self Help Groups (SHGs) on the Ganga Basin. It has done business of over 25 lakhs till March 2024, since its launch in September 2023.

On 22 April 2023, Asok Kumar launched "Ganga Bhog- Gangotri se Ganga Sager" to promote livelihood generation among the Women SHGs on the banks of the river centered on the concept of " Paanch Maa"- MAa (River Ganga), MAndir (Temples), MAhila (women); MAtti (land, soil) and MAdhu-MotaAnaj (Honey and Millets). The idea was to include Mitai or sweets made by local women using Millets, Honey procured from local soil to be given as Bhog or Prasad (offering) in the temples on the Ganga river basin.

Under the River ranching program started by NMCG in association with CIFRI (Central Inland Fisheries Research Institute) about 93 lakhs (9.3 million) Indian Major Carp fingerlings were released into the river- 4 million in the 2022-23 period- to conserve fish diversity, increase the number of indigenous fish species and thereby increasing the prey base for river Dolphin and ensure livelihood for fishermen.

(iv) Promotion of Cultural heritage and tourism – with extensive mapping of tangible and intangible heritages on the banks of the river and promoting responsible tourism and helping locals to augment their income by building their capacities to supply house-keeping items and services to hotels in tourist destinations like Rishikesh, Haridwar etc; to act as tourist guides and to set up home stay facilities to augment their income. Over 100 youth from towns on the banks of River Ganga have been trained to do Ganga Artis. A detailed Standard Operating Procedure (SoP) for the ritual was prepared with the help of Paramarth Niketan and they were given proper uniforms and equipment to perform Artis. These trained youth have started *Artis* in over 60 *ghats* or river fronts after their training in August-December 2023.

NMCG sponsored INTACH to study and publish an authentic document on the tangible and intangible cultural heritage of the Ganga Basin. The study was completed in December 2022 and two voluminous books were published.

(v) People's participation have been increased phenomenally in all the NMCG programs in the last 2 years, ever-since Asok Kumar has taken charge as DG. Stake holders were actively involved in the discussions and preparations of

River Basin Management (RBM) Plans, District Ganga Plans, Cleaning up of ghats, Ghat pe Yoga, Ghat pe Artis, Ghat pe Haat etc. International Yoga day celebrated on June 21 of 2022 and 2023 as "Ghat Pe Yoga" saw over1 million people participating all along the Ganga basin. Weekly village markets –Ghat pe Haat- have also been started in many Ghats to encourage people to visit the river banks and in turn help to keep them clean.

Cadres of 45,000 Ganga Doots; 3000 Ganga Praharis, 700 Ganga Mitras were developed to involve and engage local youth in Ganga rejuvenation and biodiversity protection activities.

MoUs were signed on 5 June 2023 with Chancellors/Vice Chancellors of 50 universities to involve college students in the activities of Students in Ganga Rejuvenation activities. Monthly webinars "Igniting Young Minds: rejuvenating rivers" were held on every 1st Wednesdays of a month, since then.

(vi) Building up of institutions and capacities of stakeholders: Asok Kumar has taken special efforts to build institutions and their building their capacity for sustenance of the programs initiated by NMCG. These include: eg formation of District Ganga Committees (DGSs) and holding "DGC forum meetings" (District Ganga Committees 4M-Monthly, Mandate, Minuted and Monitored meetings), formation and Expansion of River Cities Alliances (RCA) and Global River Cities Alliance; preparation of Urban River Management Plans (URMPs), building capacities of Municipal officials and stake holders to prepare good bankable DPRs, URMPs etc.

On 6th April 2022, Asok Kumar started DGC forum (4M) meetings- a mandated monthly fixed meetings of District Ganga Committees formed earlier. 139 DGCs had very few held meetings, till this was launched along with a portal -Ganga District Performance Monitoring System (GDPMS). From almost ZERO at the start of April 2022, till 15 February 2024, DGCs have held 2594 meetings and their MoM (Minutes of Meetings) uploaded to GDPMS. Meetings held under District Magistrates or the heads of the administration of districts on the banks of river Ganga, have 3 major agenda to deliberate- "National or NMCG agenda, local agenda and seasonal agenda. First is the "National or NMCG agenda" to discuss on the projects being taken up or to be taken up in the district to keep the river clean, monitor the drains out falling into the river, polluting industries etc. The second agenda is about the local issues like maintenance of ghats, natural farming, local festivals on river banks keeping them clean etc. The third is the "seasonal agenda" which deals with seasonal issues like "Catch the rain" campaign during monsoon, annual festivals, *melas* etc and to ensure that the river and its basin are kept clean. There has been a tremendous involvement of the local administration in management of the river.

This decentralized involvement of local administration and stakeholders have attracted the attention of National Green Tribunal, which has started direct dialogues with the DGCs. They have been asked to prepare District Ganga Plans etc and oversee its implementation.

These efforts of Asok Kumar ensured sustenance and quality of the efforts done by Namami Gange to clean and rejuvenate River Ganga and its tributaries by actively involving local stakeholders and ensuring decentralized monitoring.

6.4 All these activities under ArthGanga are captured in the logo of Arth-Ganga, designed under the guidance of Asok Kumar. The logo *encompasses the spirituality* (reminds of Om and Ganesha), *Rupee* symbol to show the economic connect and a saffron dot representing a *Bindi depicting N*ari *Shakti, a key element in Arth-Ganga* or a *rising sun* to show economic prosperity, the basic theme of Arth Ganga. He created the tag lines in Hindi "*Behti Nadi, Behtar Jeevan*" and in English, "Banking on River Ganga", the *pun intended*!

7.0 Focus in Urban areas for pollution abatement of the rivers flowing by:

7.1 River Cities Alliance (RCA), which was started on 25 November 2021, with 20 cities on the basin of River Ganga, has now gown to an organization with 142+ cities on the banks of various Indian rivers. RCA held its first meeting – DHARA in February, 2022 at Pune in which 105 river cities/towns participated.
7.2 The concept of Urban River Management Plans (URMPs) to bring river management as a serious element of urban planning was also started with the help of National Urban River Management Institute (NIUA). 3 URMPs have been prepared and efforts are underway to prepare 60 URMPs in by 2025.
7.3 On 6 December 2023, at the COP 28 in Dubai, Asok Kumar on behalf of RCA signed the Memorandum of Common Purposes (MoCP) with the 124 member MRTCI – (Mississippi River Towns and Cities Initiative) of USA.
7.4 Global River Cities Alliance
Expanding the scope and reach of RCA further, Global River Cities Alliance (GRCA), led by the National Mission for Clean Ganga (NMCG) was launched on 10th December 2023 at the COP28 of the United Nations Climate Change Conference in Dubai, United Arab Emirates with countries namely India, Egypt, Netherlands, Denmark, Ghana, Australia, Bhutan, Cambodia, Japan and river-cities of The Hague (Den Haag) from the Netherlands, Adelaide from Australia, and Szolnok of Hungary and International funding agencies the World Bank, Asian Development Bank (ADB), Asian Infrastructure Investment Bank (AIIB) and knowledge management institution like KPMG entering into a partnership, expanding the reach of the existing River Cities Alliance (RCA), formed by

NMCG in 2021. With its launch on 10th December, 2023, GRCA is now a unique alliance covering 275+ global river-cities in 11 countries, international funding agencies and knowledge management partners. This is the first time such an alliance was launched in the world.

The launch of GRCA, signifies a momentous step in global efforts toward river conservation and sustainable water management. Following this, partner countries are poised to coordinate post-COP activities, shaping the architecture of GRCA for effective implementation. The event also marked the presence of multi-lateral institutions such as The World Bank, Asian Development Bank and Asian Infrastructure and Investment Bank.

8.0 PRAYAG

8.1 PRAYAG, (**P**latform for **R**eal-time **A**nalysis of **Y**amuna **A**nd **G**anga and their tributaries), launched on 20 April 2023, serves as a Real-Time Monitoring Centre dedicated to the strategic planning and oversight of projects, river water quality, and more. It utilizes diverse online dashboards, including Ganga Tarang Portal, PMT Tool Dashboard, and Ganga Districts Performance Monitoring System and live feeds from CCTV cameras at various STPs and construction sites. This has a made a paradigm shift in functioning of the STPs, as technical data of quantity & quality of input & output water from 308 STPs in River Ganga basin are monitored 24X7 at PRAYAG along with river quality information from 110 locations in the River Ganga and its tributaries. This comprehensive approach ensures efficient real-time analysis and monitoring, contributing to the effective management of initiatives and resources in the mission to rejuvenate the Yamuna and Ganga rivers. The trend analytics on the functioning of the STPs incorporated in the dash board ensures that all monitored STPs are kept operational meeting prescribed output standards 24 by 7 and the river water quality is maintained as per the norms.

PRAYAG brought a paradigm shift in of all crucial spatial and non-spatial information of Ganga basin to take accurate & transparent decisions.

8.2 PRAYAG has many GIS based information portals. Apart from the Realtime water quality monitoring, it has geotagged the details of the location of (a) all STPs built with all sources of funds- state, central, (b) all Grossly Polluting Industries in the Ganga basin; (c) all drains falling into the river Ganga, most of which have been tapped & d) digital mapping of all utilities in 172 towns in Ganga basin (being added in phases).

8.3 PRAYAG displays:

(i) The PMT Dashboard, or Project Monitoring Tool, plays a crucial role in tracking project progress and identifying risks. It provides real-time data on

total projects, completed projects, projects in progress, tendering, and projects in the planning stage. Accessible to both the general public and administrators the dashboard facilitates monitoring, delay analysis, and generation of MIS reports. Key features of the system include real-time tracking of project metrics, continuous project progress monitoring with delay analysis, and schedule tracking. The system offers flexibility by allowing the generation of custom reports, providing insights at the project, state, and river levels.

(ii) Ganga Tarang, the STP Performance Monitoring Dashboard, focuses on real-time data for sewage treatment plants (STPs). It provides insights into STP status, effluent quality, and compliance with discharge standards, generating alerts for deviations. The three-tier access system accommodates STP operators, state-level authorities, and national regulators. Key features include real-time monitoring of STP status and effluent quality, robust compliance tracking, and an alert mechanism for non-compliance instances. The three-tier access ensures tailored accessibility for STP stakeholders at different levels.

(iii) GDPMS (Ganga District Performance Monitoring System) is a web-based tool overseeing the performance of District Ganga Committees (DGCs) in implementing the Namami Gange program. The dashboard monitors meetings, generates custom reports, and tracks key performance indicators at the district level. Key features of GDPMS include real-time monitoring of DGCs, assessing meeting frequency, and tracking Minutes of Meeting (MOM) submissions. The system allows for flexibility through custom reports, enabling performance analysis based on state-wise, year-wise, and district-wise parameters. GDPMS maintains a vigilant focus on key performance indicators linked to the successful implementation of the Namami Gange initiative, ensuring a comprehensive and streamlined monitoring process.

(iv) River Water Quality Monitoring Dashboard provides comprehensive insights into water quality parameters across 97 monitoring stations along the Ganga. It assesses compliance, generates custom reports, and offers graphical representations for in-depth analysis. Key features include displaying parameters and compliance status, custom reports based on location and time frames, and a graphical representation of average values.

(v) The Ganga Knowledge Centre- The Ganga Knowledge Centre strategically optimizes investments within the NGRBA, focusing on creating and managing knowledge resources, promoting research innovation, and facilitating stakeholder dialogue. It aims to establish a robust knowledge foundation for the Ganga River Basin by encouraging innovation and forming partnerships. Immediate outcomes include knowledge-based products, outreach through query tools, and technical support, contributing to capacity building and reinforcing commitment to advancement within the NGRBA context.

(vi) CCTV Monitoring of STP (Live) - It ensures 24/7 surveillance, effectively addressing security risks like theft and vandalism. Off-site live monitoring enables rapid responses to security incidents, while rugged cameras offer durability in diverse environmental conditions. These features collectively contribute to constant vigilance, swift responsiveness, and a robust security infrastructure for STPs.

8.3 On 28 February, 2024, “Digital Kilometre Stones" were virtually added to the central line of the main-stem Ganga, accurately marking latitude and longitude of every kilometre distance from Dev Prayag, the origin of Ganga to Ganga Sagar, where it meets the Bay of Bengal. This is the first time such a marking is done on any river profile in India.

8.4 NMCG's monitoring systems and dashboards showcase a dedicated commitment to Ganga River conservation. These tools offer real-time insights into project progress, water quality, and district-level performance, empowering stakeholders to contribute to the success of the Namami Gange program. Leveraging technology and knowledge, NMCG ensures a holistic approach to preserving the cultural and ecological significance of the Ganga River.

9.0 Strengthening and application of the Regulatory Powers of NMCG:

Even though the Authority order 2016, conferred regulatory powers under Environmental Protection Act, 1986 to NMCG, these were not being effectively used by NMCG. However, during Sri Asok Kumar’s tenure as DG, many industrial clusters and industries were closed down on the orders of DG, NMCG, and permitted to open only after effective pollution abatement steps were taken by them. This happened in Mathura, Kanpur, Gorekhpur, PILKUA, etc. Tent city project on the river- bed of Varanasi was stopped in 2023. Nearly 50+ Hydro Electric Projects in the fragile Bagirathi eco-zone were stopped, despite severe pressure from the Ministries of Power and Jal Shakti and State Government of Uttarakhand.

A permission Cell was set up in NMCG to decide on permissions to be given for projects on Ganga basin, which affect the riverine ecosystem.

10.0 Ganga Knowledge Centre

10.1 Many Research Works started many years back were brought to completion during the tenure of G. Asok Kumar, as DG, NMCG. This boosted the collection of authentic and evidence based studies about Ganga in the knowledge domain. Pathanjali mapped all the flora in the Ganga basin, WII studied about the biodiversity, especially the riverine based fauna in the Ganga and its tributaries. IITR made a study of all Constructed wetlands in India and

evolved guidelines for their construction. Another study on the characteristics of sludge from STPs was done by IITR. Study by NEERI confirmed the presence of friendly bacteriophages in Ganga water, giving it its unique quality.
GKC had sanctioned different GIS based research projects touching different aspects of river rejuvenation to use geospatial data in a wide variety of areas, including legislative and policy development, the allocation and management of water resources, river system spatial planning, monitoring & basin management. Ganga Knowledge Portal is at https://gyanganga.ai/ and is on PRAYAG.
10.2 Study reports completed and presented during his tenure include:
10.2.1 GIS based Mapping of Microbial Diversity: GIS -based Mapping of Microbial Diversity across the Ganges for Ecosystem Services - (implementation by CSIR-NEERI, Nagpur) to understand the water quality of river Ganga along the stretch with the specific focus on parameters that indicates the interactions of river with its varied environment. Being highly analytics and interdisciplinary, this project provided a strong scientific rationale to understand bacteriophage and microbial population diversity, purifying properties of the Ganga and disease predications.
10.2.2 Geo-Ganga: Space Based Mapping & Monitoring of Ganga River by Indian Institute of Remote Sensing: IIRS, Dehradun submitted its report in 2023 on the research project titled "Geo-Ganga: Space Based Mapping & Monitoring of Ganga River" and funded by "Namami Gange Program". The main objectives of this research project were to develop a geo-portal of entire Ganga basin for visualization and analysis of hydro- meteorological and other thematic parameters, to develop a geospatial solution for mapping and monitoring of river water quality in respect of few parameters, water level and solid waste dumps in the active river channel or buffer area of the selected river stretch/s and to generate flood hazard potential zones for the selected stretch using geospatial techniques.
10.2.3 LiDAR Mapping: NMCG collaborated with Survey of India, to facilitate the Ganga rejuvenation task by using Geographic Information System (GIS) technology for mapping the Ganga basin in high resolution generating Digital Elevation Models (DEM) in the mapping Area is 43,084 km2 along the 10 Km buffer of River.
10.2.4 Sand Mining Mapping using UAV Technology: Rapid assessment of sand mining and its impact on Ganga river between Raiwala to Bhogpur stretch using historical remote sensing data and drone technology project to take stock of the status of mining activity in the entire state and assess the impact on river morphology and ecology to evolve a long-term strategy. It is important to note that several of these tributaries are highly sediment-charged, and therefore, a

balance has to be maintained between excessive sediment aggradation and channel stability through river training and strategic sand mining.

10.2.5 IIT Kanpur executed the research project on "Geomorphic and Ecological Impacts of Sand Mining in Large Rivers as revealed from high resolution historical remote sensing data and drone surveys.

10.2.6 Spring Rejuvenation using Remote Sensing, GIS & UAV technology: Pilot study on spring rejuvenation for Tehri Gadhwal district of Uttarakhand – under implementation by Survey of India/ CGWB. Nature of project is Schematic mapping of Tehri Garhwal district for inventory of springs using LiDAR technology, Hydro-geomorphic & liniment studies for identification of different type of springs & their recharge zones and implementation of spring rejuvenation by constructing rainwater harvesting and artificial structures.

10.2.7 Rejuvenation of dying springs in Tokoli Gad catchment of Tehri Garhwal District using Geo-chemical & Geo-physical techniques is with IIT Roorkee.

11.0 Jal Shakti Kendras(JSKs):

As an innovative attempt to break the Silos in water sector, G.Asok Kumar conceptualized "Jal Shakti Kendras" (JSK) as a Common One stop resource centre on all water related information of a district, as a part of the "Catch The Rain" campaign he had initiated. JSKs are now set up in over 600 out of 700 odd districts in the country. These JSKs will also act as "knowledge centres" for disseminating information related to water, techniques for water conservation and water saving and also provide technical guidance to local people as well as to the district administration. They will help in preparing the water budget for the district and planning crops based on the water availability.

12.0 Significant contributions to the water sector in India:

G. Asok Kumar has made major contributions to the Indian water sector. As Mission Director, National Water Mission, in 2020 he started a very popular water conservation campaign "Catch The Rain", with the tagline, Catch The Rain, where it falls, when it falls", which earned him the moniker "The Rain man of India". This campaign was appreciated by Hon PM Modi, who launched it as a nationwide "Jal Shakti Abhiyan: Catch The Rain Campaign" on 22March 2021. As MD, NWM, Asok Kumar was instrumental in setting up "Jal Shakti Kendras", a common water resource centres, in all districts of the country; starting "National Bureau of Water Use Efficiency"; launching "Sahi Fasal" campaign to nudge farmers to diversify to crops which are water and climate appropriate and less water intensive to earn "more net-income per drop."

He is a recipient of many awards and recognition for his contributions in various diverse sectors, including water and river rejuvenation.

13.0 Conclusion:

As seen from the above, using innovative interventions, involving cutting edge technologies and effective decentralisation and people's active participation, Sri G. Asok Kumar could achieve visible, well appreciated and acknowledged improvements in the rejuvenation and cleaning of River Ganga and its tributaries. He also conceived and setup many institutions like the District Ganga Committees, PRAYAG, River Basin Management Cells, Permission Cells, Ganga Knowledge Centres, River Cities Alliance and Global River Cities Alliance, Jalaj Units and Jal Shakti Kendras etc which are now well established at the ground for sustained rejuvenation and cleaning of River Ganga and its tributaries.

More can be seen at https://asokji.in/
https://asokji.in/sites/default/files/NamamiGange_Handbook-Feb24.pdf